



SLOVENSKI STANDARD

oSIST prEN 14983:2021

01-november-2021

Preprečevanje eksplozij in zaščita v podzemnih rudnikih - Oprema in zaščitni sistemi za odvajanje jamskega plina

Explosion prevention and protection in underground mines - Equipment and protective systems for firedamp drainage

Explosionsschutz in untertägigen Bergwerken - Geräte und Schutzsysteme zur Absaugung von Grubengas

Prévention de l'explosion et protection contre l'explosion dans les mines souterraines - Appareils et systèmes de protection destinés au captage du grisou

<https://standards.iteh.ai/catalog/standards/sist/a3977452-e49f-4c9c-8061-b355d1165f7/osist-pr-en-14983-2021>

Ta slovenski standard je istoveten z: **prEN 14983**

ICS:

13.230	Varstvo pred eksplozijo	Explosion protection
73.100.20	Prezračevalna, klimatizacijska in razsvetljevalna oprema	Ventilation, air-conditioning and illumination equipment

oSIST prEN 14983:2021

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN 14983:2021](#)

<https://standards.iteh.ai/catalog/standards/sist/a3977452-e49f-4c9c-8061-b355d11fc5f7/osist-pren-14983-2021>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 14983

September 2021

ICS 73.100.20

Will supersede EN 14983:2007

English Version

Explosion prevention and protection in underground mines - Equipment and protective systems for firedamp drainage

Prévention de l'explosion et protection contre l'explosion dans les mines souterraines - Appareils et systèmes de protection destinés au captage du grisou

Explosionsschutz in untertägigen Bergwerken - Geräte und Schutzsysteme zur Absaugung von Grubengas

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 305.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Equipment and protective systems for firedamp drainage	9
4.1 General.....	9
4.2 Borehole standpipes	9
4.3 Drainage pipes for seals and stoppings	12
4.4 Water separators at drainage points	12
4.5 Firedamp pipes	12
4.5.1 General requirements for firedamp pipes.....	12
4.5.2 Measuring points for measuring equipment in firedamp drainage pipes	12
4.6 Pressure vessels in firedamp drainage plant.....	12
4.7 Pressure generators.....	13
4.7.1 Requirements for pressure generators	13
4.7.2 Reserve pressure generators.....	13
4.7.3 Location of pressure generators.....	13
4.8 Venting of the drained firedamp	14
4.9 Flame arresters in pipelines	14
4.9.1 Flame arresters.....	14
4.9.2 Non-flammable firedamp vent pipe outlets	15
4.9.3 Non-flammable drainage pipe.....	16
4.9.4 Protection of gas utilization plant.....	16
4.9.5 Reserve container and operating state	16
4.10 Requirements for the design of electrical safety devices	17
4.11 Electrostatic ignition risks.....	17
5 Instructions for installation and use.....	17
Annex A (informative) Installation and use of firedamp drainage system	18
A.1 General.....	18
A.2 Work on firedamp pipes.....	18
A.3 Measures to be taken when gas levels fall below or exceed limit values during firedamp drainage	19
A.4 Failure or shutdown of pressure generators	19
Annex B (normative) Monitoring of firedamp drainage system	20
B.1 Examination and inspection by competent persons	20
B.2 Measurement of the drained firedamp mixture and pressure.....	20
B.2.1 Measurements taken by hand	20

B.2.2	Fixed monitoring equipment.....	20
B.3	Documentation	21
B.4	Firedamp circuit plan.....	21
	Annex C (normative) Requirements for location of pressure generators	22
	Annex D (normative) Requirements for degassing equipment for abandoned surface openings.....	23
	Annex E (informative) Example for calculation of t_{90}-path	27
E.1	General	27
E.2	Example for calculation of t_{90}-path	27
	Annex F (informative) Significant Changes between this European Standard and EN 14983:2007	29
	Annex ZA (informative) Relationship between this European Standard and the essential requirements of Directive 2014/34/EU aimed to be covered	31
	Bibliography	32

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN 14983:2021](https://standards.iteh.ai/catalog/standards/sist/a3977452-e49f-4c9c-8061-b355d11fc5f7/osist-pren-14983-2021)
<https://standards.iteh.ai/catalog/standards/sist/a3977452-e49f-4c9c-8061-b355d11fc5f7/osist-pren-14983-2021>

prEN 14983:2021 (E)

European foreword

This document (prEN 14983:2021) has been prepared by Technical Committee CEN/TC 305 “Potentially explosive atmospheres — Explosion prevention and protection”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 14983:2007.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN 14983:2021](https://standards.iteh.ai/catalog/standards/sist/a3977452-e49f-4c9c-8061-b355d11fc5f7/osist-pren-14983-2021)

<https://standards.iteh.ai/catalog/standards/sist/a3977452-e49f-4c9c-8061-b355d11fc5f7/osist-pren-14983-2021>

Introduction

Firedamp drainage is a technical process for selected gas removal, the purpose of which is to reduce the risks presented by inflammable gas and air mixtures. Firedamp drainage is therefore a measure for preventive explosion protection.

In the mining industry, firedamp is drained from the underground workings of gassy mines, from boreholes and abandoned mine workings to ensure that mine workers are not exposed to the risks associated with the occurrence of an explosive atmosphere at their place of work. In this case, the explosion risk results from unacceptable accumulations of firedamp occurring in the waste areas and cavities left in the in the rock strata after the coal has been extracted from the coal seam. In such cases, the need to drain these accumulations, and the complexity of the drainage system, depends on the amount of firedamp produced by the coal and the likelihood of it occurring in explosive quantities in the mine roadways and coal face. Examples of situations that might cause firedamp to move in dangerous concentrations from the waste area or cavities into the mine roadways: a breakdown of the mine ventilation system or a sudden reduction in the underground atmospheric pressure. National legislation in EU coal mining member countries requires workers to be withdrawn to a safe place if firedamp levels attain a specific nationally defined value in the general body of mine air. Firedamp drainage is therefore often used in gassy mines in an attempt to ensure that the concentration of firedamp in the general body of mine air is kept well below this critical level, even during abnormal situations such as those described above.

Once the accumulations of firedamp have been drained from the affected areas, it is usually discharged to the mine surface, but in some cases it is discharged into the mine return/ventilation system. In systems where the firedamp is brought to the mine surface, it is discharged to the atmosphere through an earthed metallic discharge stack or pressurized and delivered to a utilization system, such as a gas-fired boiler.

In abandoned mines, firedamp drainage is used

- to prevent gas pressure building up and gas issuing at the surface in an uncontrolled manner, and
- to protect workers at an adjacent nearby mine, or
- to allow it to be utilized, for example by burning it in a gas-fired boiler to produce heat or to generate electricity.

prEN 14983:2021 (E)**1 Scope**

This document specifies the requirements for equipment and protective systems for firedamp drainage at mines. It also contains requirements for the construction and monitoring of this equipment and protective systems (see EN 1127-2:2014).

This document does not apply to firedamp utilization systems beyond the utilization shut-off device.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1127-2:2014, *Explosive atmospheres - Explosion prevention and protection - Part 2: Basic concepts and methodology for mining*

EN 13237:2012, *Potentially explosive atmospheres — Terms and definitions for equipment and protective systems intended for use in potentially explosive atmospheres*

EN 61508:2010, *(all parts), Functional safety of electrical/electronic/programmable electronic safety-related systems*

EN ISO 16852:2016, *Flame arresters - Performance requirements, test methods and limits for use (ISO 16852:2016)*

EN ISO/IEC 80079-38:2016, *Explosive atmospheres - Part 38: Equipment and components in explosive atmospheres in underground mines (ISO/IEC 80079-38:2016)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1127-2:2014 and EN 13237:2012 and the following apply:

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1**electrostatic leakage resistance**

electrical resistance measured between an object and earth

3.2**active explosion isolation system**

system which is designed to be activated by a detector and control and indicating equipment (CIE) which are inherent parts of the system and stop explosions from travelling through pipelines or limit destructive effects of the explosion

[SOURCE: EN 15089:2009, 3.7.1]

3.3**starting by-pass**

temporary and specific by-passing of a safety device when starting the pressure generator of a firedamp drainage plant

3.4**design pressure** **p_a**

pressure at the top of each chamber of the pressure equipment chosen for the derivation of the calculation pressure of each component

[SOURCE: EN 764-1:2015+A1:2016, 3.2.33]

3.5**firedamp**

any potentially explosive mixture of flammable gases naturally occurring in a mine

Note 1 to entry: As firedamp consists mainly of methane, the terms “firedamp” and “methane” are used frequently in mining practice as synonyms.

[SOURCE: EN 1127-2:2014, 3.1]

3.6**firedamp collector pipe**

gas pipes connected directly to one or more boreholes or gas drainage points

3.7**firedamp mains pipe**

gas pipes connected to more than one gas collector pipe

3.8**extinguishing system**

system that is used to discharge suppressant agent to extinguish flame and keep it from propagating into the vent pipe

3.9**technically leaktight**

made in such a way that no changes in gas composition occur

Note 1 to entry: Gas pipes, items of plant and equipment, including all detachable and non-detachable connections can be technically leaktight.

Note 2 to entry: The term “technically leaktight” means that diffusion through statically stressed seals can occur.

3.10 **t_{90} -path**

distance between the monitoring position and the shut-off device

Note 1 to entry: This distance depends on the measured gas/air mixture, taking account of the velocity of flow, the response time (according to EN 61779-29-1:2016) of the measurement device, the tripping time and the closing time of the rapid shut-off device; the response time is the time taken to achieve 90 % of the final indication.

3.11**flame arrester**

device fitted to the opening of an enclosure, or to the connecting pipe work of a system of enclosures, and whose intended function is to allow the flow but prevent the transmission of flame

[SOURCE: EN ISO 16852:2016, 3.1]

ITC STANDARD PREVIEW
(standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/a3977452-e49f-4c9c-8061-b355d11fc5f7/osist-pren-14983-2021>

prEN 14983:2021 (E)**3.12****flame arrester element**

portion of a flame arrester whose principal function is to prevent flame transmission

[SOURCE: EN ISO 16852:2016, 3.3]

3.13**endurance burning**

stabilized burning for an unlimited time

[SOURCE: EN ISO 16852:2016, 3.6]

3.14**endurance flame arrester**

flame arrester that prevents flame transmission during and after endurance burning

[SOURCE: EN ISO 16852:2016]

3.15**short time burning**

stabilized burning for a specified time

[SOURCE: EN ISO 16852:2016, 3.16]

3.16**short-time burning proofed deflagration flame arrester**

flame arrester designed to prevent the transmission of an atmospheric deflagration and during and after short-time burning

<https://standards.iteh.ai/catalog/standards/sist/a3977452-e49f-4c9c-8061-5b571e9a93e1/pr-en-14983-2021>

<https://standards.iteh.ai/catalog/standards/sist/a3977452-e49f-4c9c-8061-5b571e9a93e1/pr-en-14983-2021>

Note 1 to entry: In this case designed as end-of-line flame arrester (at the end of a pipe work), that means end-of-line deflagration flame arrester. Equipped with an integrated temperature sensor that emits a signal suitable for initiating countermeasures.

3.17**detonation**

explosion propagating at supersonic velocity and characterized by a shock wave

[SOURCE: ISO 8421-1:1987, 1.12]

3.18**detonation flame arrester**

flame arrester designed to prevent the transmission of a detonation

Note 1 to entry: In this case designed as in-line flame arrester for stable detonations, that means in-line detonation flame arrester.

[SOURCE: EN ISO 16852:2016, 3.15]

3.19**deflagration**

explosion propagating at subsonic velocity

[SOURCE: ISO 8421-1:1987, 1.11]

3.20

deflagration flame arrester

flame arrester designed to prevent the transmission of a deflagration

Note 1 to entry: In this case designed as in-line flame arrester, that means in-line deflagration flame arrester.

[SOURCE: EN ISO 16852:2016, 3.14]

3.21

pre-volume flame arrester

flame arrester that, after ignition by an internal ignition source, prevents flame transmission from inside an explosion-pressure-resistant containment (e.g. a vessel or closed pipe work) to the outside, or into the connecting pipe work

Note 1 to entry: In this case the explosion-pressure-resistant containment would be the housing of the pressure generator.

[SOURCE: EN ISO 16852:2016, 3.23 – modified: admitted term deleted and Note 1 to entry changed]

4 Equipment and protective systems for firedamp drainage

4.1 General

Electrical and mechanical equipment used in firedamp drainage shall not pose an explosion risk. For this reason:

- equipment used in the firedamp drainage systems where flammable gas is likely to occur shall be explosion protected either Group I Category M1 or M2, or, if on the surface, Group II Category 1 or 2;
- where measuring equipment is in direct contact with firedamp/air concentration within the explosive range (e.g. the purity measuring instruments), it shall be category M1 ignition protected. In surface installations, Group II, Category 1 equipment may be used;
- the drainage system shall have a facility to allow it to be shut down, usually automatically, where the concentration of extracted firedamp in the pipework reaches a prescribed limit, taking into account the response time of the monitoring equipment and the t_{90} -path (see Annex E).

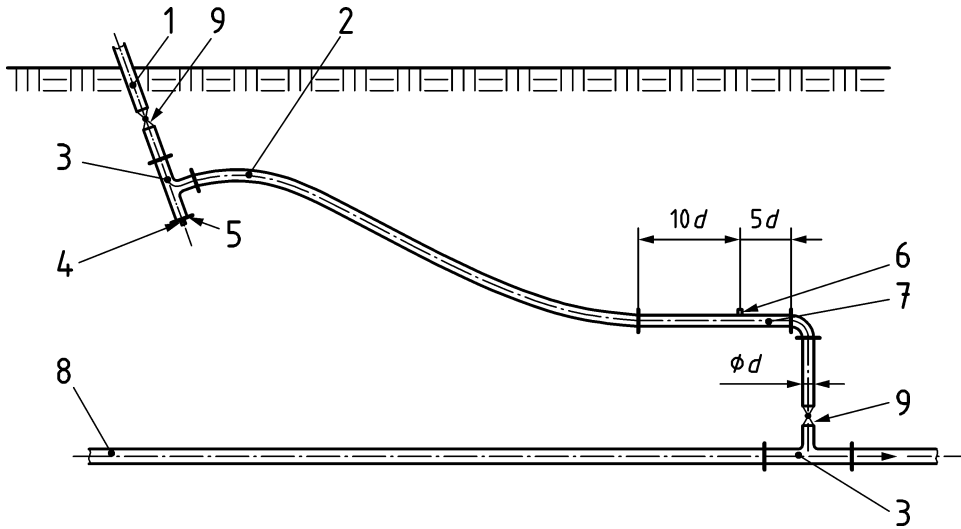
NOTE 1 Care is needed during start-up of the firedamp drainage system when the pipework will be full of air and will at some stage pass through the explosive range.

NOTE 2 Normally, the explosive range for firedamp/air mixtures is specified within a range of about 5 % by volume to 15 % by volume methane. Automatic shutdown usually takes place when a methane concentration reaches a level of approx. 22 % by volume.

4.2 Borehole standpipes

Standpipes shall be made in such a way that devices (Y- or T-pieces) for the insertion of borehole probes can be attached to them. The standpipe shall have connection facilities to allow it to be connected, it shall be made in such a way and arranged so that no reduction in cross-section occurs, and should contain a suitable facility for measuring the volume flow and vacuum pressure where the boreholes are accessible for measuring and taking firedamp samples, e.g. a measuring section (see Figure 1, Figure 2, Figure 3 and Figure 4).

prEN 14983:2021 (E)

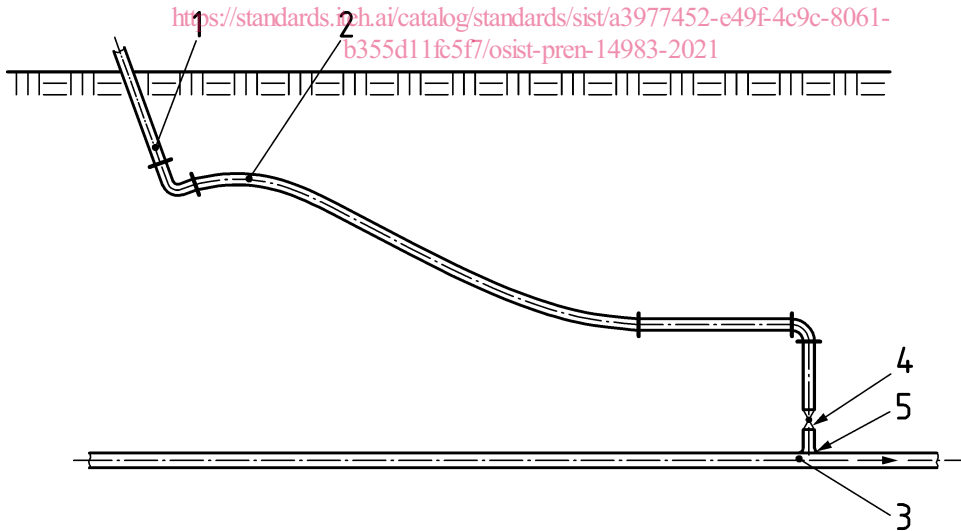


Key

- | | | | |
|-----|---|---|---------------------------|
| d | diameter | 5 | facility for measurements |
| 1 | borehole standpipe | 6 | facility for measurements |
| 2 | flexible hose suitable for the required flow and pressure | 7 | measuring section |
| 3 | T-piece | 8 | collector pipe |
| 4 | connection for water separator | 9 | shut-off device |

Figure 1 — Example of connection of roof borehole to collector pipe when measurement and control are accessible

oSIST prEN 14983:2021
<https://standards.iteh.ai/catalog/standards/sist/a3977452-e49f-4c9c-8061-b355d11fc5f7/osist-pren-14983-2021>



Key

- | | |
|---|---|
| 1 | borehole standpipe |
| 2 | flexible hose suitable for the required flow and pressure |
| 3 | collector pipe |
| 4 | shut-off device |
| 5 | suitable connection for collector pipe |

Figure 2 — Example of connection of roof borehole to collector pipe when measurement and control are not accessible